

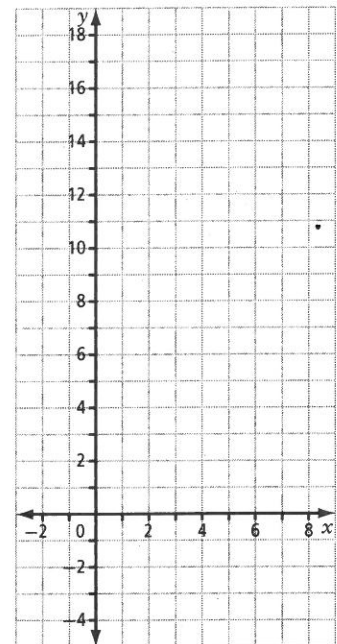
Working Example 1: Compare Graphs of a Linear Function and the Square Root of the Function

- a) Given $f(x) = 4x - 3$, graph the functions $y = f(x)$ and $y = \sqrt{f(x)}$.
 b) Compare the graphs.

Solution

- a) Determine the y -value in the second column of the table. Then, complete the third column by taking the square root of the second column. Use the table of values to sketch the graphs of $y = f(x)$ and $y = \sqrt{f(x)}$. (Hint: You could graph $y = f(x)$ on your graphing calculator and then use the table function to complete the second column of the table.)

x	$y = 4x - 3$	$y = \sqrt{4x - 3}$
0	-3	$\sqrt{-3}$ (undefined)
0.75		
0.8		
1		
2		
3		
5		



- b) From your table of values, determine the points of intersection:

(_____, 0); (_____, 1)

How is the x -intercept of the graph of $y = 4x - 3$ related to the graph of the function $y = \sqrt{4x - 3}$?

Why are these points of intersection referred to as *invariant points*?

For which values of x is the graph of $y = \sqrt{4x - 3}$ above the graph of $y = 4x - 3$? How are these values related to the invariant points?

For which values of x is the graph of $y = \sqrt{4x - 3}$ below the graph of $y = 4x - 3$?



To see a similar question, refer to Example 1 on pages 80–81 in *Pre-Calculus 12*.